We consider a particular two-sample homogeneity testing problem which is often encountered in case-control studies with contaminated controls, or detecting a treatment effect when some subjects are not affected by treatment in biological experiments. To utilize the information from not only the mean shift but also possible change in variance, we propose an EM-test which is designed to simultaneously detect both mean difference and differential variability in the two samples. We show that the EM-test statistic has a chi-square null limiting distribution. The asymptotic properties under local alternatives are also investigated. The main results are established for general location-scale families. Simulation results show that the EM-test possesses more accurate empirical type I error and higher power than the existing methods. Finally, two real data examples are given to illustrate the application of the proposed method.